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EXAMINER	
NGUYEN, HAO X	

ART UNIT	PAPER NUMBER
2662	

DATE MAILED: 07/26/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/869,367	ZIMMERMANN, GERHARD	
	Examiner	Art Unit	
	Hao X. Nguyen	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *05 October 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Preliminary Amendment acknowledged

Claims 3 and 7 are amended.

Claim 13 is added.

Specification

This application does not contain an abstract of the disclosure as required by 37 CFR 1.72(b). An abstract on a separate sheet is required.

Claim Objections

Claim 5 is objected to because of the following informalities: the clause "by means of a delay line (21.....)" should be "by means of a delay line (20.....)". Appropriate correction is required.

Drawings

The drawings are objected to because Figures 1 and 3 should be labeled "Prior Art". Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure

is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-13 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In regards to claim 1, line 5, the phrase "possibly an analog-to-digital converter (61) and a digital-to-analog converter (60),... " renders the claim indefinite, by creating a conditional limitation. Throughout the claim, component connections are disclosed in the alternative because of this conditional limitation ("or", lines 7, 10, 12).

In regards to claims 3 and 12, the word "relatively" renders the claim indefinite. It is not clear how "high memory delay time" is defined in relation to other memory delay times.

In regards to claim 4 and 12, the word "preferably" renders the claim indefinite. It is not clear whether "interpreting the time information of the real-time protocol" is a required limitation of the claim.

In regards to claim 5, lines 7 and 9, the word "or" renders the claim indefinite. It is not clear what operation is being performed based on the alternative format of the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 2, 3, 4, 5, 10, 11 and 12 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya (US Pat. No. 6,085,072), in view of Vahatalo et al. (US Pat. No. 5,737,410).

In regards to claims 1 and 5,

Referring to Figure 5, Komiya discloses a telephone system (column 1, lines 6-10; claims 1 and 5 - within at least one data transmission network connecting several

subscribers; at least one shared protocol) and a voice encoding/decoding method (column 1, lines 6-10; claims 1 and 5 - transmission system for transmitting speech information) of a mobile terminal device that receives receiving signals using an antenna.

A demodulator extracts voice data packet (Figure 5; column 5, lines 27-29; claims 1 and 5 - by means of data packets) from the receiving signal.

Each subscriber comprises a microphone 11 and a speaker 10 (Figure 5; claim 5 – reproduced through an earpiece unit 7 and the voice signal generated by each subscriber through a speaker unit; claims 1 and 5 - a speaker 6 and earpiece unit 7), connected to a telephone system (Figure 5; claim 1 - network) via an antenna 2, a multiplexer 3, an RF amplifier 17, a Modulating/Demodulating unit, and a DSP unit (Figure 5; claim 1 - a voice data transmission unit 3), a signal converting unit (Figure 5; claim 1 - an analog-to-digital converter 61 and a digital-to-analog converter 62, comprising a transceiver unit and a voice data conversion unit). The microphone 11 (Figure 5; column 5, lines 47-48; claim 5 - the voice signal generated by each subscriber through a speaker unit 6) and the Signal Converting unit (Figure 5; column 5, lines 47-49; claim 5 - an analog-to-digital converter 61; voice signal is converted into speech information) are connected to the DSP Unit and the Modulating/Demodulating unit (Figure 5; claim 5 - speech information is transmitted in a transmitter unit).

A microphone 11 and an A/D Converter (Figure 5; claim 1 - the speaker unit 6 or the inserted analog-to-digital converter 61) are connected to a DSP Unit (Figure 5; claim 1 - the transmission unit) via an additional input S7 (Figure 5; claim 1 - an additional

input 12) of an echo canceller 14 (Figure 5; claim 1 - an echo cancellation unit 5) and an output S13 (Figure 5; claim 1 - the output 13). A subtraction input S11 (Figure 5; claim 1 - a subtraction input 11) of the echo canceller 14 (Figure 5; claim 1 - the echo cancellation unit 5) is connected to a speaker 10 via a D/A converter (Figure 5; claim 1 - to the earpiece unit 7 or the inserted digital-to-analog converter 60.

Komiya discloses the limitations of claims 1 and 5 but it does not disclose the echo cancellation (an additional input 14 and a subtraction input 15) on the receiving system and the network delay time that is based on a delay line and weighted with the coefficients k.

Referring to Figure 4, Vahatalo discloses an echo canceller that receives a speech signal from speaker A at port RIN and transmits it to the echo path and to hybrid. The speech signal of speaker A received at port RIN (Figure 4; column 5, lines 4-5; claim 5 - voice signal or speech information) is passed via an adjustable delay 43 (Figure 4; column 5, line 6; claim 5 - a delay line 21, 22, and 23) to an adapter filter 40 (Figure 4; column 1, lines 61-65; column 5, line 6; claim 5 - weighted with the coefficients k) that derives an echo estimate therefrom. This echo estimate (Figure 4; column 5, line 7; claim 5 - voice signal or speech information that has been delayed and weighted with coefficients k) is summed together with the signal received at port SIN in reverse phase by summer 41 (Figure 4; column 5, lines 7-8; claim 5 - is subtracted from the echo signal created at the respective other subscriber 50, 51).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify an echo cancellation system of Komiya by including an echo

cancellation system for the receiving end as the one for the transmitting end incorporating the network delay, as shown by Vahatalo, so the level of echo in the signal coming to the earpiece is decreased (Vahatalo: column 5, lines 9-11).

In regards to claim 2,

Referring to Figure 5, Komiya discloses an echo canceller that is inside the DSP unit to be connected to a Modulating/Demodulating unit (the output of a control unit 18 connected to the voice data transmission unit 3).

Komiya does not disclose the additional echo cancellation unit (9) is provided with a control input (17) for controlling a memory delay time of the voice signal or of the speech information that corresponds to the minimum delay time of the network.

Referring to Figure 4, Vahatalo discloses an echo canceller B (the additional echo cancellation unit 9) that includes a calculation unit 44 (column 5, line 51 - a control input 17 connected to the output of a control unit 18) that determines the delay component of the echo path by calculating the correlations between signals RIN and SIN (column 5, lines 49-56 – for controlling a memory delay time of the voice signal or of the speech information).

Referring to Figure 3, Vahatalo also discloses the echo path that may be represented by the total impulse response that typically consists of pure delay De and an echo signal (column 5, lines 26-30 - a memory delay time that corresponds to the minimum delay time of the network).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify an echo cancellation system of Komiya by including a control input

for controlling a memory delay time of the voice signal or of the speech information, as shown by Vahatalo, so the delay component of the echo path can be determined by calculating the correlations between signals RIN and SIN employing the samples taken (Figure 4; column 5, lines 49-56).

In regards to claim 3,

Komiya discloses the limitations of claim 1 but it does not disclose a transmission system, with an echo cancellation unit comprising a delay line consisting of several elements, wherein the first delay elements of the delay line has a relatively high memory delay time that is substantially equal to the minimum overall propagation time of the voice data signals in both directions of the data network.

Referring to Figure 4, Vahatalo discloses a delay line consisting of a cancellation unit 44, samplings 45 and 46, a memory 47 and an adjustable delay (a delay line consisting of several delay elements).

Referring to Figure 3, Vahatalo also discloses the echo path that may be represented by the total impulse response that typically consists of pure delay De and an echo signal (column 5, lines 26-30 – the first delay element of the delay line has a relatively high memory delay time that is substantially equal to the minimum overall propagation time of the voice data signals in both directions of the data network).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation method of Komiya by having a delay line that consists of several delay elements so a delay time can be easily adjusted for different echo paths through the network, as shown by Vahatalo, (column 5, lines 40-56).

In regards to claim 4,

Komiya discloses the limitations of claim 1 but it does not disclose the memory delay time of the first delay element (20) of the delay line may be controlled by way of the voice data transmission unit (3), preferably by interpreting the time information of the real-time protocol.

Referring to Figure 4, Vahatalo discloses a calculation unit 44 that calculates the correlations between signals RIN and SIN employing the samples taken in a voice system (column 1, lines 20-26; column 5, lines 49-56 - the first delay element 20 may be controlled by way of the voice data transmission unit 3, by interpreting the time information of the real-time protocol).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation method of Komiya by having the first delay element 20 that may be controlled by way of the voice data transmission unit 3 as shown by Vahatalo, preferably by interpreting the time information of the real-time protocol as shown by Kline, thereby calculating a proper value of delay for an echo path, so a cancelled echo is accurate (Kline; column 1, lines 38-40; Vahatalo; column 1, lines 56-60; column 5, lines 40-45, 50-56).

In regards to claim 10,

Komiya discloses the limitations of claim 5 but it does not disclose the coefficients k of the delay line 20, 22, 23 that are set to zero when the network delay time changes.

Referring to Figure 4, Vahatalo discloses an echo canceler method that always adapts to a new echo path at the beginning of the call (column 1, lines 50-65 - the coefficients k of the delay line 20, 22, 23 are set to zero when the network delay time changes).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the echo cancellation system of Komiya by having the coefficients k of the delay line 20, 22, 23 set to zero when the network delay time changes, as shown by Vahatalo, because the new echo path would have a new significant echo locations and tap coefficients of a digital filter are only calculated at significant echo locations; at other locations, the tap coefficients are set to zero (Vahatalo, column 2, lines 65-67).

In regards to claim 11,

Komiya discloses the limitations of claim 5 but it does not disclose the change in network delay time to be measured and the values of the coefficients k assigned to the delay elements (20, 22, 23) to be relocated within the delay line according to this change.

Referring to Figure 4, Vahatalo discloses an echo canceler method that always adapts to a new echo path at the beginning of the call (column 1, line 56-60 - the change in network delay time is measured). Digital signal processing offers an adaptive filter as a solution to this problem. When a signal is present or the signal level is sufficient, adaptation is initiated in which the filter coefficients are updated (column 1, line 56-65 - the values of the coefficients k assigned to the delay elements 20, 22, and

23 are relocated within the delay line according to this change) on the basis of the correlation of the speech signal and the return echo signal.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the echo cancellation system of Komiya by having the values of the coefficients k assigned to the delay elements 20, 22, and 23 relocated within the delay line according to the change of network delay time, as shown by Vahatalo, because the delay line would provide a sufficient echo estimate to be subtracted from the corresponding echo (column 5, lines 5-11).

In regards to claim 12,

Komiya discloses the limitations of claim 5 but it does not disclose the memory delay time of the first delay element (20) with the relatively high delay time to be controlled through the voice data transmission unit (3) by preferably interpreting the time information of the real-time protocol and relocation of the coefficients k within the delay line is automatically carried out with the change of the delay time of the first delay element.

Referring to Figure 3, Vahatalo also discloses the echo path that may be represented by the total impulse response that typically consists of pure delay De and an echo signal (column 5, lines 26-30 – the first delay element of the delay line has a high memory delay time).

Referring to Figure 4, Vahatalo discloses a calculation unit 44 that calculates the correlations between signals RIN and SIN employing the samples taken (column 5,

lines 49-52 - the first delay element 20 may be controlled by way of the voice data transmission unit 3).

Vahatalo also discloses that when a signal is present or the signal level is sufficient, adaptation is initiated in which the filter coefficients are updated (column 1, lines 60-65 - relocation of the coefficients k within the delay line is automatically carried out with the change of the delay time of the first element that has a relatively high memory delay time) on the basis of the correlations of the speech signal and the return echo.

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the echo cancellation system of Komiya by having the coefficients within the delay line updated when the high memory delay of the element 20 changes by interpreting the time information of the real-time protocol, as shown by Vahatalo, because this method would provide a sufficient echo estimate for echo cancellation (Vahatalo; column 5, lines 5-11).

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya in view of Vahatalo, as applied to claim 5 above, and further in view of Urbanski (US Pat. No. 5,696,821).

Komiya discloses the limitations of claim 5 but it does not disclose detecting the loss of data packets arising from transmission and suppressing the subtraction of the corresponding, delayed voice signal or of the corresponding, delayed speech information accordingly.

Referring to Figure 3, Urbanski discloses the adaptation constant μ that controls the amount of error that is generated (column 11, lines 7-9, 25-31 - loss of data packets arising from transmission is detected) when the optimum solution is reached.

The adaptation constant μ also has control of how fast the echo canceller will adapt to its environment and therefor is used to maintain stability and convergence of the filter (column 11, lines 25-31 - the subtraction of the corresponding delayed voice signal or of the corresponding delayed speech information is suppressed accordingly).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the echo cancellation system of Komiya by having the subtraction of the corresponding, delayed voice signal suppressed accordingly when the loss of data packets arising from transmission is detected, as shown by Urbanski, so the delay time can be adjusted properly for an echo path (column 11, lines 7-31).

Claims 7 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya in view of Vahatalo, as applied to claim 5 above, and further in view of George C. Sackett & Christopher Y. Metz (ATM and Multiprotocol Networking, copyright 1997 by the McGraw-Hill Companies, Inc.), hereafter Sackett.

In regards to claim 7,

Komiya discloses the limitations of claim 5 but it does not disclose when one or several data packets have gotten lost, the respective preceding voice data packet is repeated.

Referring to Figure 9.6, Sackett discloses a Forward Error Correction (FEC) that can recover from any bit errors, cell, or frame lost (page 205, first paragraph - when

one or several data packets have gotten lost, the respective preceding voice data packet is repeated).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation system of Komiya by having the respective preceding voice data packet repeated when one or several data packets have gotten lost, as shown by Sackett, because the determination for the delay time for an echo cancellation is based on the samples of a voice signal or a speech information (Vahatalo; column 5, lines 50-56).

In regards to claim 9,

Komiya discloses the limitations of claim 5 but it does not disclose, on repeating the respective preceding voice data packet, the mating, stored voice signal or the mating, stored speech information respectively of the connected subscriber is subtracted with delay and weighting.

Referring to Figure 4, Vahatalo discloses an echo canceller that needs to employ a method that always adapts to a new echo path (on repeating the respective preceding voice data packet). It also discloses a stored voice signal is subtracted with adjustable delay and adaptive filtering (column 1, lines 54-65 - with delay and weighting).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation system of Komiya by having the mating, stored voice signal or the mating, stored speech information respectively of the connected subscriber subtracted with delay and weighting, as shown by Vahatalo,

because the echo canceling has to adapt accordingly whenever there is a new echo path (column 1, lines 56-60).

Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya in view of Vahatalo and Sackett, as applied to claim 7 above, and further in view of Urbanski (US Pat. No. 5,696,821).

Komiya discloses the limitations of claim 7 but it does not disclose, on repeating the respective preceding voice data packet, the subtraction of a corresponding voice signal or of a corresponding speech information on the side of the connected subscriber is suppressed.

Referring to Figure 3, Urbanski discloses the adaptation constant μ that controls the amount of error that is when the optimum solution is reached. It also has control of how fast the echo canceler will adapt to its environment and therefor is used to maintain stability and convergence of the filter (column 11, lines 7-9, 25-31 - on repeating the respective preceding voice data packet, the subtraction of the corresponding delayed voice signal or of the corresponding delayed speech information on the side of the connected subscriber is suppressed accordingly).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation system of Komiya by having the subtraction of a corresponding voice signal suppressed when the respective preceding voice data packet is repeated, as shown by Urbanski, so the delay time can be adjusted properly for an echo path (column 11, lines 7-31).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Komiya in view of Vahatalo, as applied to claim 4 above, and further in view of Sackett.

Komiya discloses the limitations of claim 4 but it does not disclose when one or several data packets have gotten lost, the respective preceding voice data packet is repeated.

Referring to Figure 9.6, Sackett discloses a Forward Error Correction (FEC) that can recover from any bit errors, cell, or frame lost (page 205, first paragraph - when one or several data packets have gotten lost, the respective preceding voice data packet is repeated).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the echo cancellation system of Komiya by having the respective preceding voice data packet repeated when one or several data packets have gotten lost, as shown by Sackett, because the determination for the delay time for an echo cancellation is based on the samples of a voice signal or a speech information (Vahatalo; column 5, lines 50-56).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Litzenberger et al. (US Pat. No. 6,728,223 B1) discloses Echo Cancellation System.

Sekine (US Pat. No. 6,320,958 B1) discloses Remote Conference System Using Multicast Transmission For Performing Echo Cancellation.

Thoenes et al. (US Pat. No. 6,310,864 B1) discloses Voice Echo Cancellation For SVD Modems.

Ho (US Pat. No. 5,912,966) discloses Enhanced Echo Cancellation for Digital Cellular Application.

Fletcher et al. (US Pat. No. 4,777,633) discloses Base Station for Wireless Digital Telephone System.

Eshmawy et al. (US Pat. No. 6,751,203 B1) discloses Methods and Apparatus for The Production of Echo Free Side Tones.

Suvanen et al. (US Pat. No. 6,081,732) discloses Acoustic Echo Elimination in A Digital Mobile Communications System.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hao X. Nguyen whose telephone number is 571-272-8195. The examiner can normally be reached on M-F 8AM-5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-8195. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Hao X. Nguyen
Examiner
Art Unit 2662

HASSAN KIZOU
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600